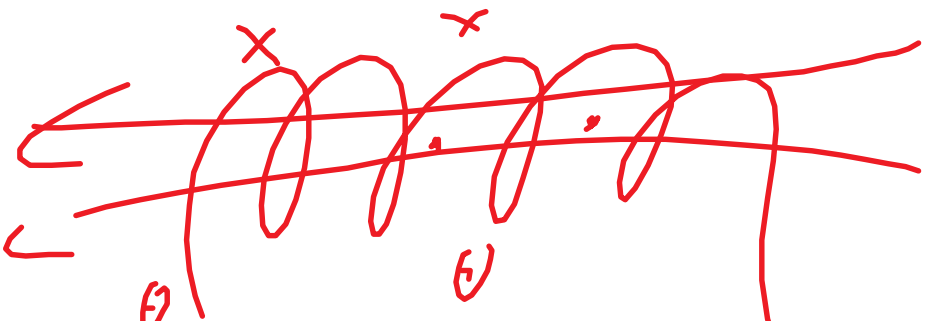
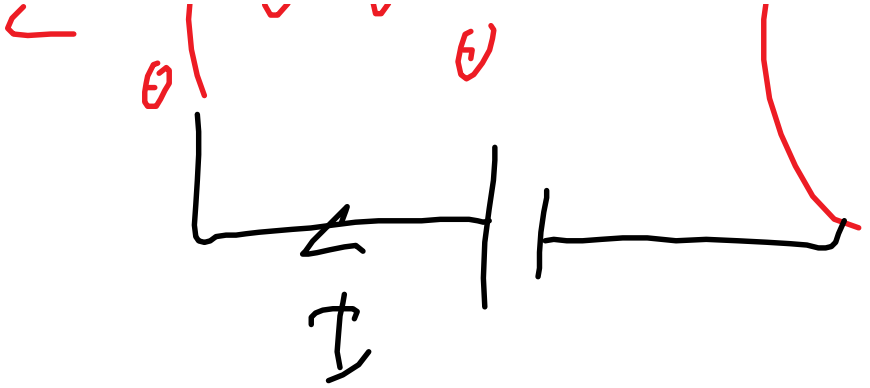
June 2002
Q22
D
Q23
Rt = 0.65+1/(1/4+1/8)=3.3167
I=V/R = 6/3.3167=1.809
Vt = emf - Ir = 6-(1.809x0.65)=4.8241
I=V/R = 4.8241/4=1.206
B
I=I1 + I2

V1=V2
I1r1=I2r2
(I-I2)r1=I2r2
Ir1 = (r1+r2)I2
I2 = I r1/(r1+r2)
I2 = 1.809x4/(4+8)=0.603
I1= 1.809x8/(4+8)=1.206

Q24
D
Q25





A

26

c

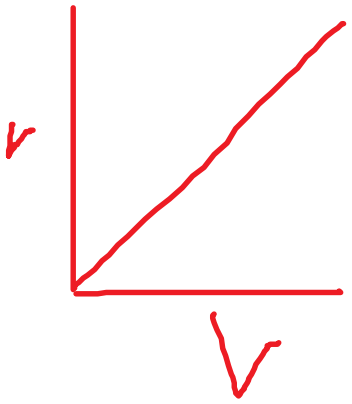
27

$F_c = F_B$

$mv^2/r = qvB$

$r = mv/qB$

$r \propto v$



A

Q28v=2.0m/s

emf = Blv = 0.70x0.08x2=0.112 V B

counter clockwise

Q29

f lower, the V_{back} is lower
so the I increases so the Plost = I^2r increases

Q30
emf = $-N\Delta\Phi/\Delta t$
if A isn't changing, then the B must change,

for the B to change
$B=\mu_o(N/L)I$
I must also change,
so D

Q6
$I_A = V/rt = 1.5/6.5=0.2308$
$I_B = 1.5/6.25=0.24$
$P=I^2r$
$P_A = I_A^2 R = 0.2308x0.2308x6=0.3196$ W
$P_B = 0.24x0.24x6=0.3456$ W

B delivers more power!
(less energy is dissipated in the internal resistor, more current)

Q7
emf = $N\Delta BA/t = 50x(0.1-(-0.6))$
$x(0.4x0.4x3.14159)/2.1=8.37757$ V

Induced current will be clockwise to oppose the change in magnetic field from into the page to out of the page. (clockwise current produces a magnetic field into the page)